

## CLAIMS

What is claimed is:

1           1.       A solder ball disposing apparatus for making a solder ball stationary in a state  
2       where the ball is in contact with a first bonding surface of a pad formed on a slider  
3       held by a slider holding unit for a disk drive; and a second bonding surface of a pad  
4       formed on an end portion of a lead disposed on the slider holding unit, and positioned  
5       in the vicinity of and substantially perpendicularly to the plane including the first  
6       bonding surface, the apparatus comprising:

          a solder ball feeder unit positioned apart from the slider holding unit that holds  
the slider in which each of the first and second bonding surfaces is held obliquely  
from a vertical direction by a prescribed distance; wherein

          the solder ball feeder unit accommodates a plurality of solder balls in the  
internal space thereof, and has ejecting holes formed on the bottom of the internal  
space for ejecting a gas to blow the solder balls and solder ball discharging holes  
formed in the upper portion of the internal space for discharging the blown solder  
balls out of the solder ball feeder unit; and the apparatus further comprising:

          a suction pad having a suction hole formed on a tip for sucking solder balls  
discharged from the discharging holes into the suction hole, and transporting and  
releasing the solder balls to and at the location where the solder balls contact the first  
and/or second bonding surface(s), or approach the first and second bonding surfaces.

1           2.       The solder ball disposing apparatus of claim 1, wherein the slider holding unit  
2       holding the slider has a plurality of connecting portions comprising the first and  
3       second bonding surfaces linearly formed thereon, and each of the discharging holes  
4       formed on the solder ball supply unit and the suction holes formed on the suction pad  
5       are each equal in number to a total number of the connecting portions.

1           3.       The solder ball disposing apparatus of claim 2, which is formed so that each of  
2       relative distances between the connecting portions adjacent to each other is the same

3 as each of relative distances between the suction holes and each of relative distances  
4 between the discharging holes, respectively.

1 4. A solder ball reflow apparatus for allowing a solder ball resting to reflow in a  
2 state where the ball is in contact with a first bonding surface of a pad formed on a  
3 slider held by a slider holding unit for a disk drive; and a second bonding surface of a  
4 pad formed on an end portion of a lead disposed on the slider holding unit, and  
5 positioned in the vicinity of and substantially perpendicularly to a plane including the  
first bonding surface, the apparatus comprising:

a head gimbal assembly holding unit for holding at least the slider holding unit  
with the slider so that each of the first and second bonding surfaces is tilted from a  
vertical direction, and having an accommodating portion for forming an  
environmental space to accommodate the first and second bonding surfaces, and an  
inert gas supply portion for supplying an inert gas to make the atmosphere of the  
environmental space inactive; and

an optical unit having a laser beam output opening for outputting converged  
laser beams, wherein the laser beam output opening approaches the solder ball that  
has contacted both the first and second bonding surfaces to radiate laser beams of a  
prescribed spot diameter to the solder ball; wherein

when the laser beams are radiated onto the solder ball, the atmosphere of the  
environmental space is made inactive by an inert gas supplied from the inert gas  
supply portion.

1 5. The solder ball reflow apparatus of claim 4, further comprising:

2 a solder ball bonding apparatus having a solder ball disposing apparatus,  
3 comprising:

4 a solder ball feeder unit positioned apart from the slider holding unit that holds  
5 the slider in which each of the first and second bonding surfaces is held obliquely  
6 from a vertical direction by a prescribed distance; wherein

7 the solder ball feeder unit accommodates a plurality of solder balls in the  
8 internal space thereof, and has ejecting holes formed on the bottom of the internal  
9 space for ejecting a gas to blow the solder balls and solder ball discharging holes  
10 formed in the upper portion of the internal space for discharging the blown solder  
11 balls out of the solder ball feeder unit; and the apparatus further comprising:

12 a suction pad having a suction hole formed on a tip for sucking solder balls  
13 discharged from the discharging holes into the suction hole, and transporting and  
14 releasing the solder balls to and at the location where the solder balls contact the first  
and/or second bonding surface(s), or approach the first and second bonding surfaces;  
wherein

the suction pad and the optical unit are integrally formed.

6. The solder ball reflow apparatus of claim 4, wherein the optical unit outputs  
laser beams generated from a fiber laser.

7. The solder ball reflow apparatus of claim 4, wherein the head gimbal assembly  
holding unit includes:

3 a jig for holding the slider holding means holding the slider; and

4 a table having the accommodating portion and the inert gas supply portion,  
5 and detachably holding the jig.